# Data Replication and Sharing: The Cass County experience.

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ND GIS Users Conference, September 2015

# Agenda

- History
- File Copying
- Replication
- Python
- Other Collaboration Efforts
- Challenges
- Lessons Learnt

Fargo Park District

Cass County

City of Fargo

City of West Fargo

# History

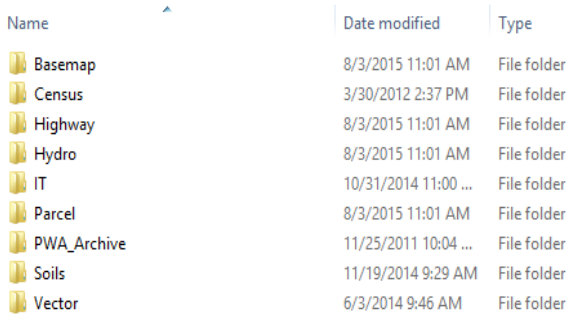
- Cass County & City of Fargo have been in a data sharing partnership since 2002.
- In 2014 Fargo Park District & City Of West Fargo joined the exchange.
- Solutions have changed over time with the changing data structure and technology.

  Shapefiles & MS Access Databases – File server

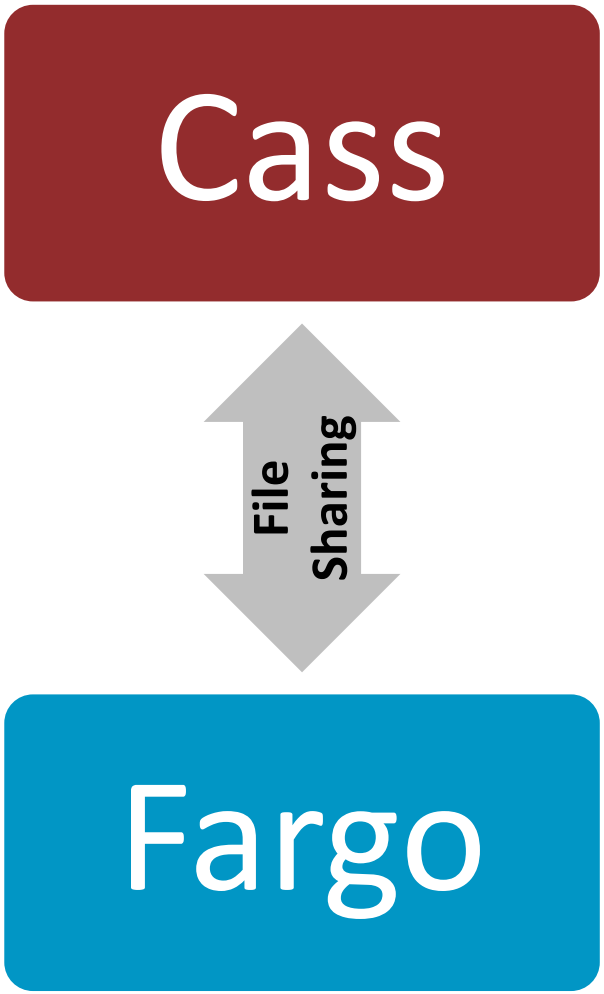
  Enterprise Geodatabase – SQL Server

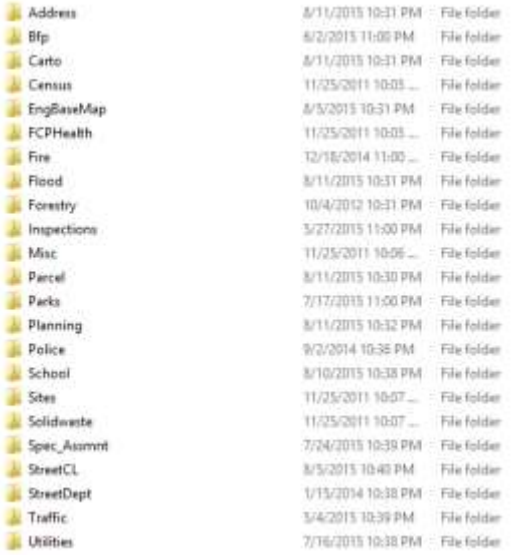
  Parcel Fabric (LGIM) & Enterprise GDB – SQL Server

# File servers using Batch Scripts (xcopy)
## (The good old days!)



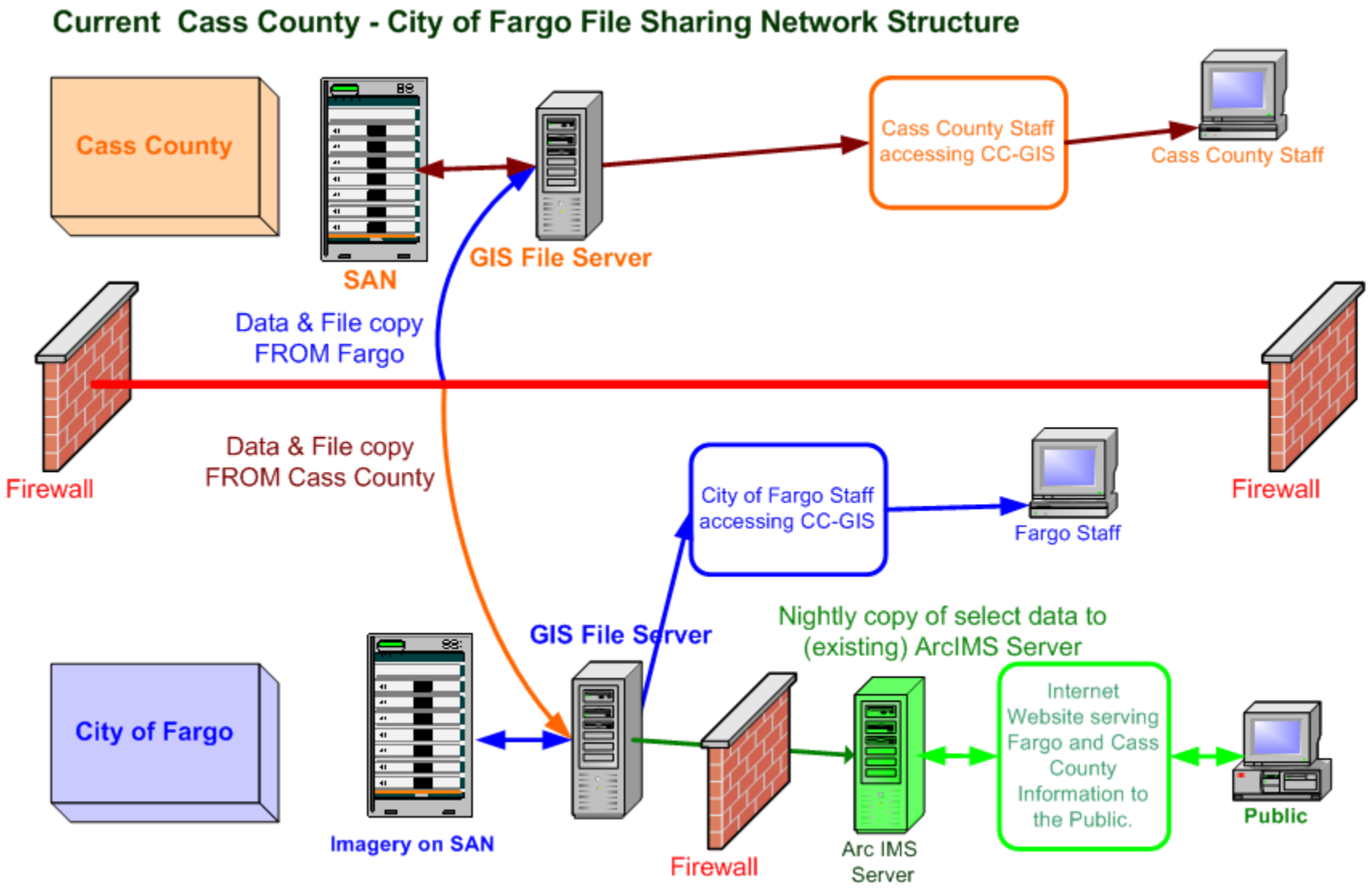
| Name | Date modified | Type |
|---|---|---|
| Basemap | 8/3/2015 11:01 AM | File folder |
| Census | 3/30/2012 2:37 PM | File folder |
| Highway | 8/3/2015 11:01 AM | File folder |
| Hydro | 8/3/2015 11:01 AM | File folder |
| IT | 10/31/2014 11:00 ... | File folder |
| Parcel | 8/3/2015 11:01 AM | File folder |
| PWA_Archive | 11/25/2011 10:04 ... | File folder |
| Soils | 11/19/2014 9:29 AM | File folder |
| Vector | 6/3/2014 9:46 AM | File folder |



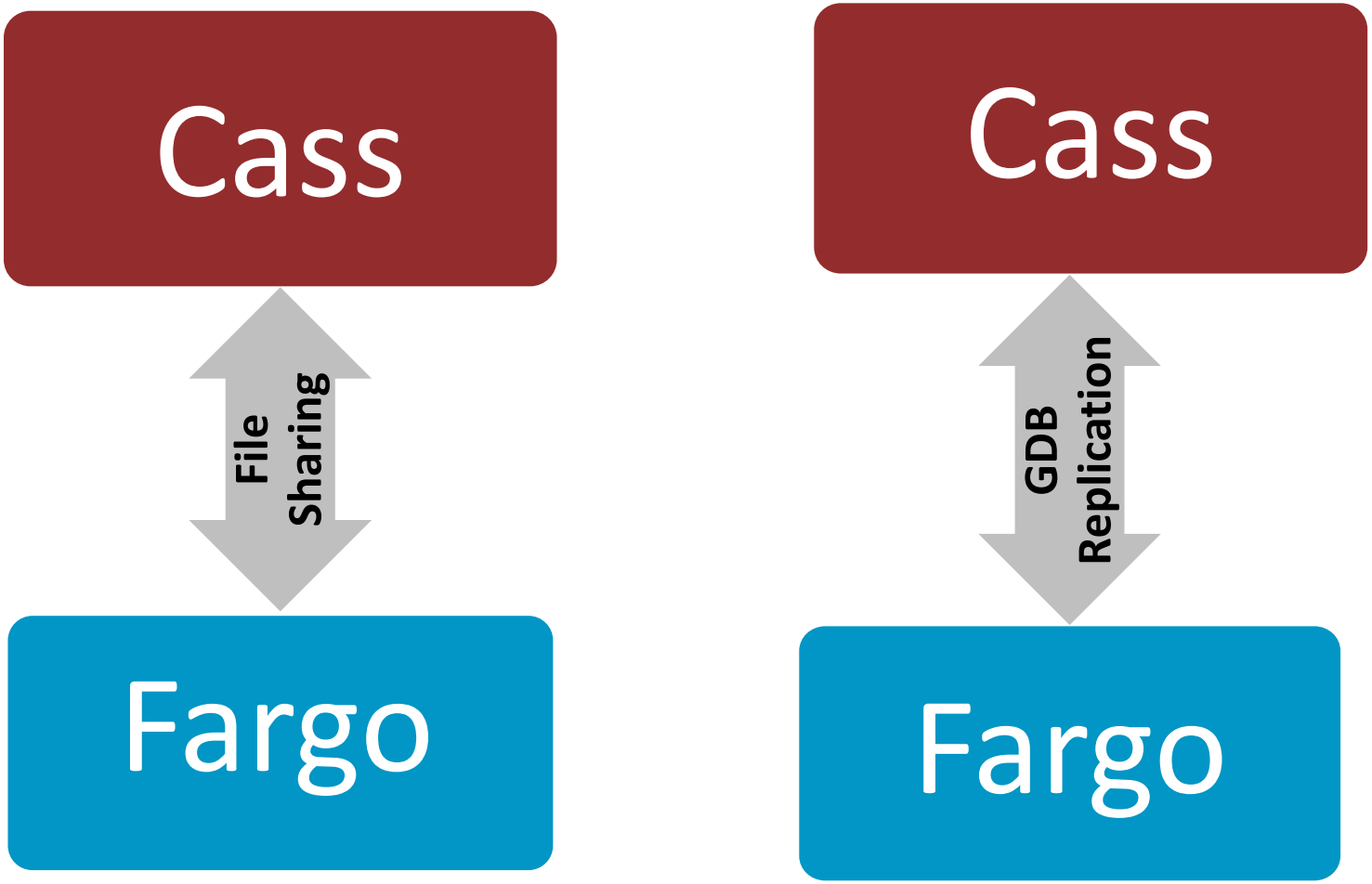



| | | |
|---|---|---|
| Address | 8/11/2015 10:31 PM | File folder |
| Bfp | 8/2/2015 11:00 PM | File folder |
| Carto | 8/11/2015 10:31 PM | File folder |
| Census | 11/25/2011 10:05 ... | File folder |
| EngBaseMap | 8/5/2015 10:31 PM | File folder |
| FCPHealth | 11/25/2011 10:05 ... | File folder |
| Fire | 12/18/2014 11:00 ... | File folder |
| Flood | 8/11/2015 10:31 PM | File folder |
| Forestry | 10/4/2012 10:31 PM | File folder |
| Inspections | 5/27/2015 11:00 PM | File folder |
| Misc | 11/25/2011 10:06 ... | File folder |
| Parcel | 8/11/2015 10:30 PM | File folder |
| Parks | 7/17/2015 11:00 PM | File folder |
| Planning | 8/11/2015 10:32 PM | File folder |
| Police | 9/2/2014 10:38 PM | File folder |
| School | 8/10/2015 10:38 PM | File folder |
| Sites | 11/25/2011 10:07 ... | File folder |
| Solidwaste | 11/25/2011 10:07 ... | File folder |
| Spec_Asmnt | 7/24/2015 10:39 PM | File folder |
| StreetCL | 8/5/2015 10:40 PM | File folder |
| StreetDept | 1/13/2014 10:38 PM | File folder |
| Traffic | 5/4/2015 10:39 PM | File folder |
| Utilities | 7/16/2015 10:38 PM | File folder |

# 2005 Conceptual



# File Servers & One-Way Replication
(Hybrid v1)



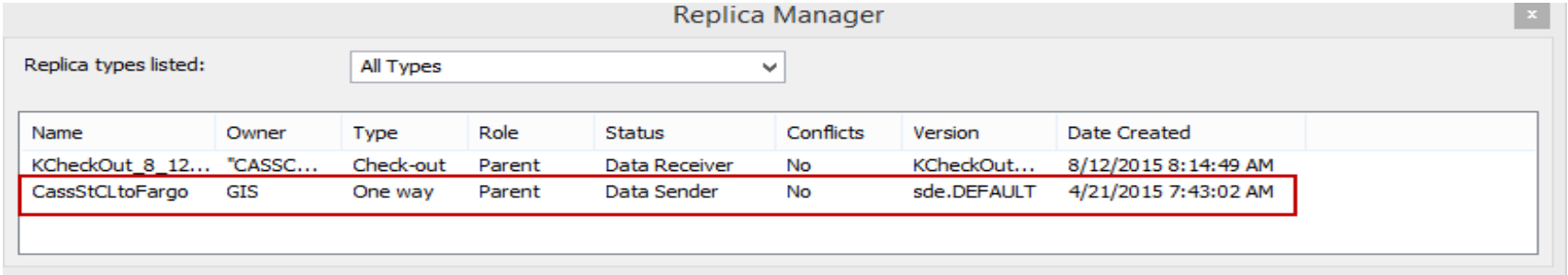
# Replication

- Data distribution method between a replica pair.
- One replica resides in original GDB, the related replica in a different GDB.
- Advantage is that only changes are replicated.
- SQL user must be set up on destination server for access.
- Data to exchange **must** have Global IDs.

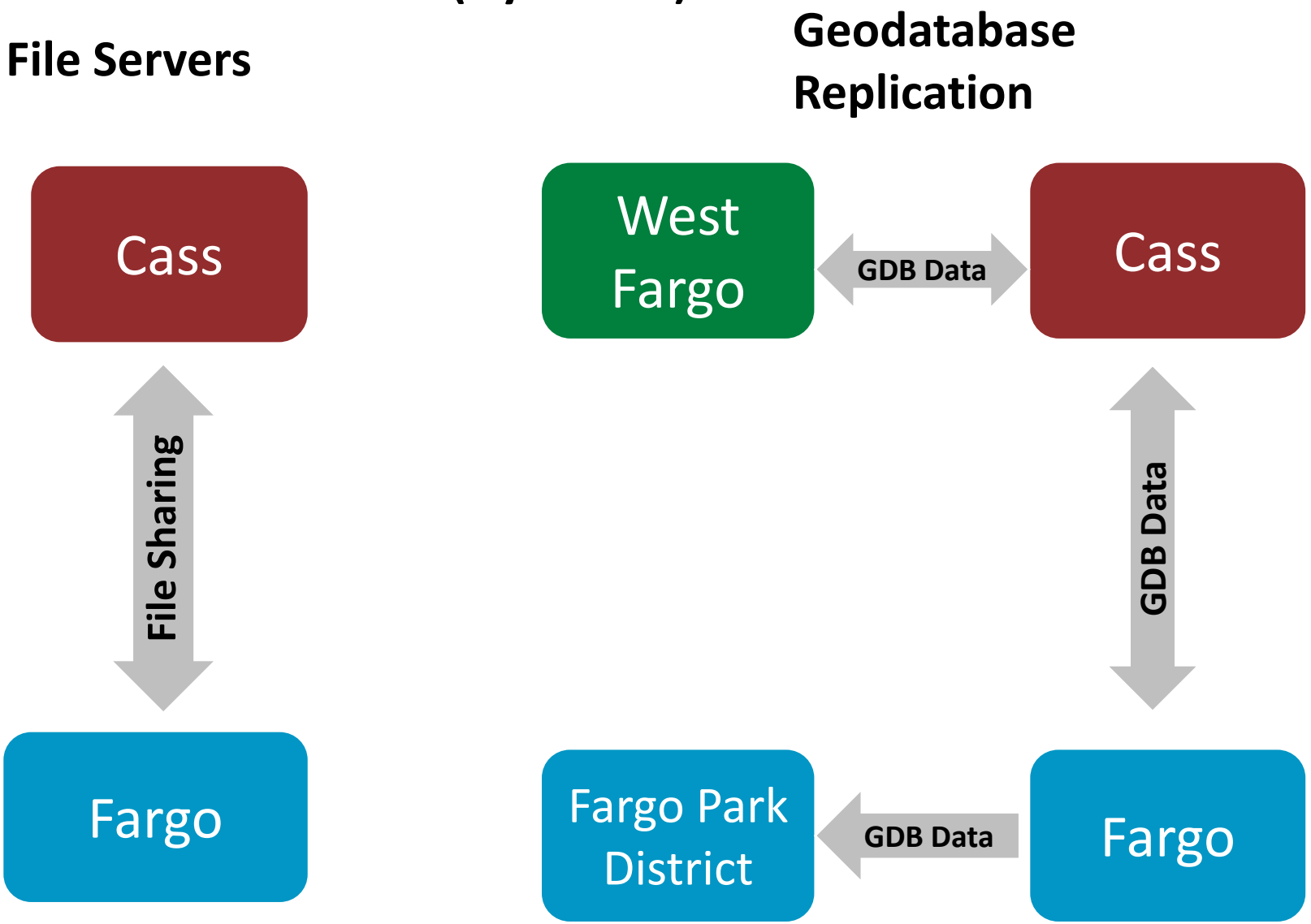
# Replication Process

- Create an MXD containing features classes to be replicated with SQL user connection.
- Create parent to child replica using replica wizard.

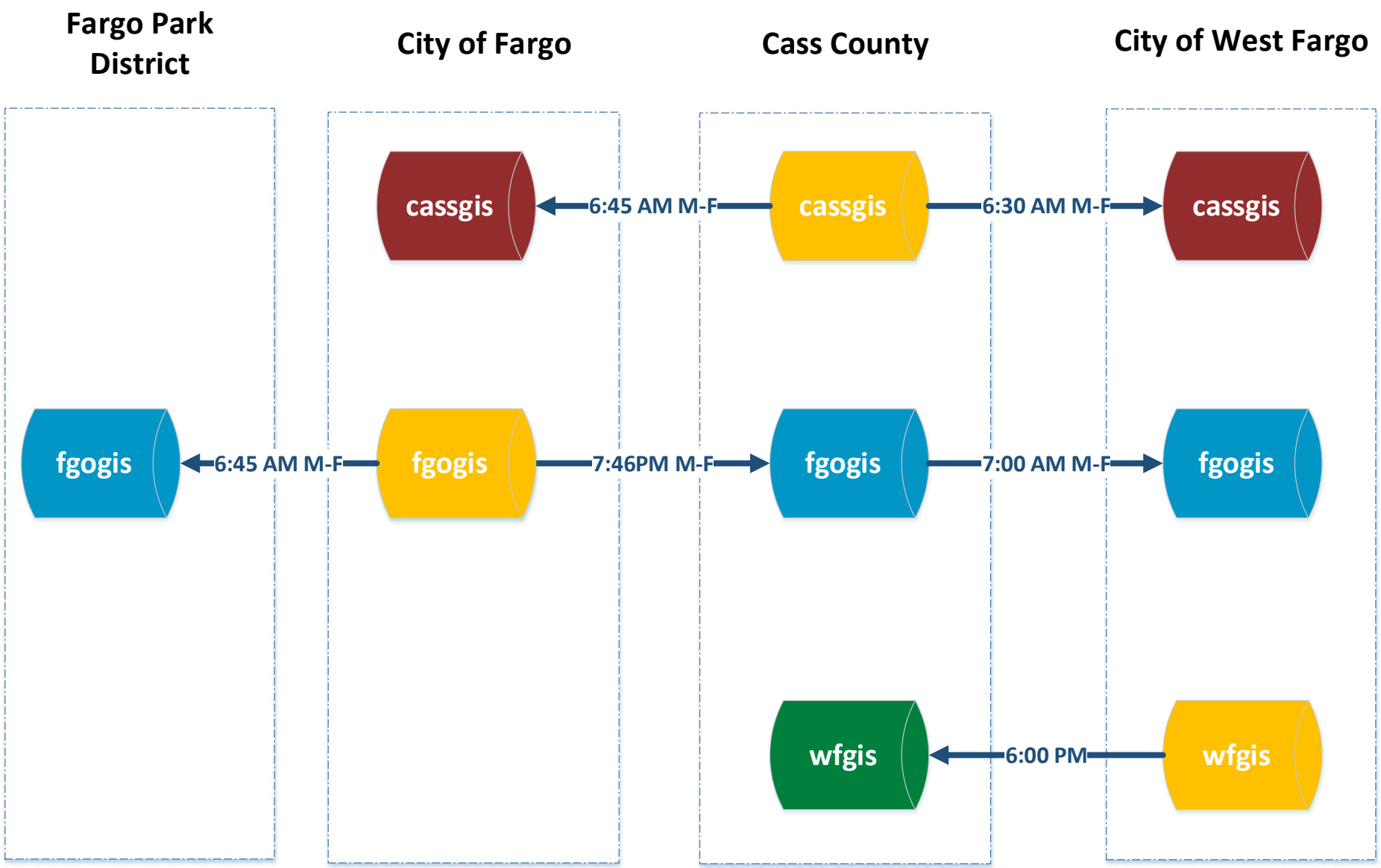

  - Register existing data only
  - Simple model
  - Uncheck Replicate related data
- Verify the replica exists in Replica Manager.



# File Server & Replication
## (Hybrid v2)



# Replication




* Note: **Yellow** database indicates the parent

# From replication to Python scripts

- When Cass & Fargo implemented the parcel fabric replication was no longer a viable solution.
- Tax parcels and other features are deleted & appended every night from LGIM GDB to Cass GDB.
- Replication of these feature classes took too long because every record had to be transferred.
- Python scripts now “pull” data rather than “push”.

# Python Scripts

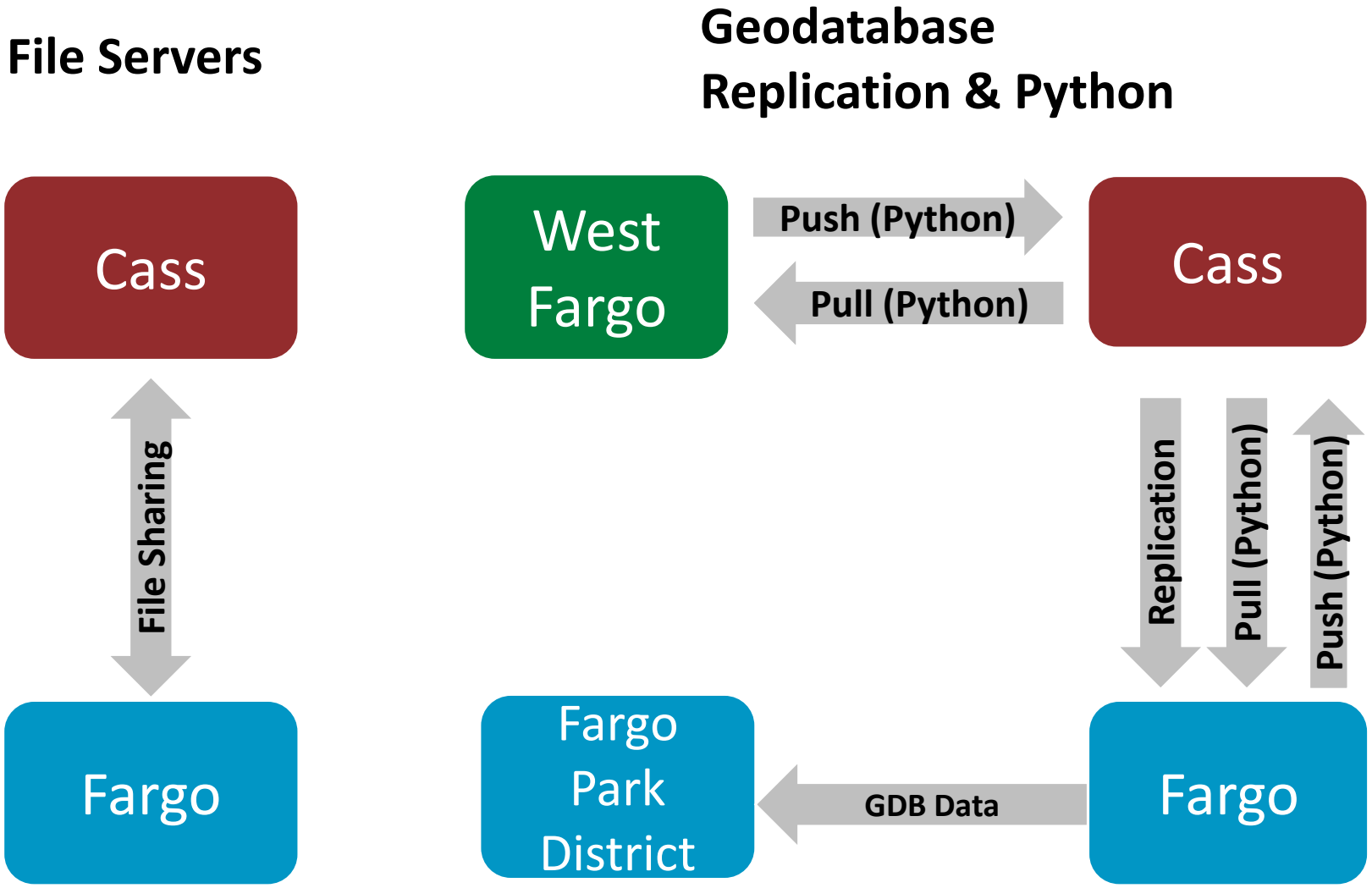
- Scheduled in Windows Task Scheduler.
- Delete & Append process.
- Fargo pull daily, monthly & weekly from Cass.
- West Fargo pull daily & weekly from Cass.

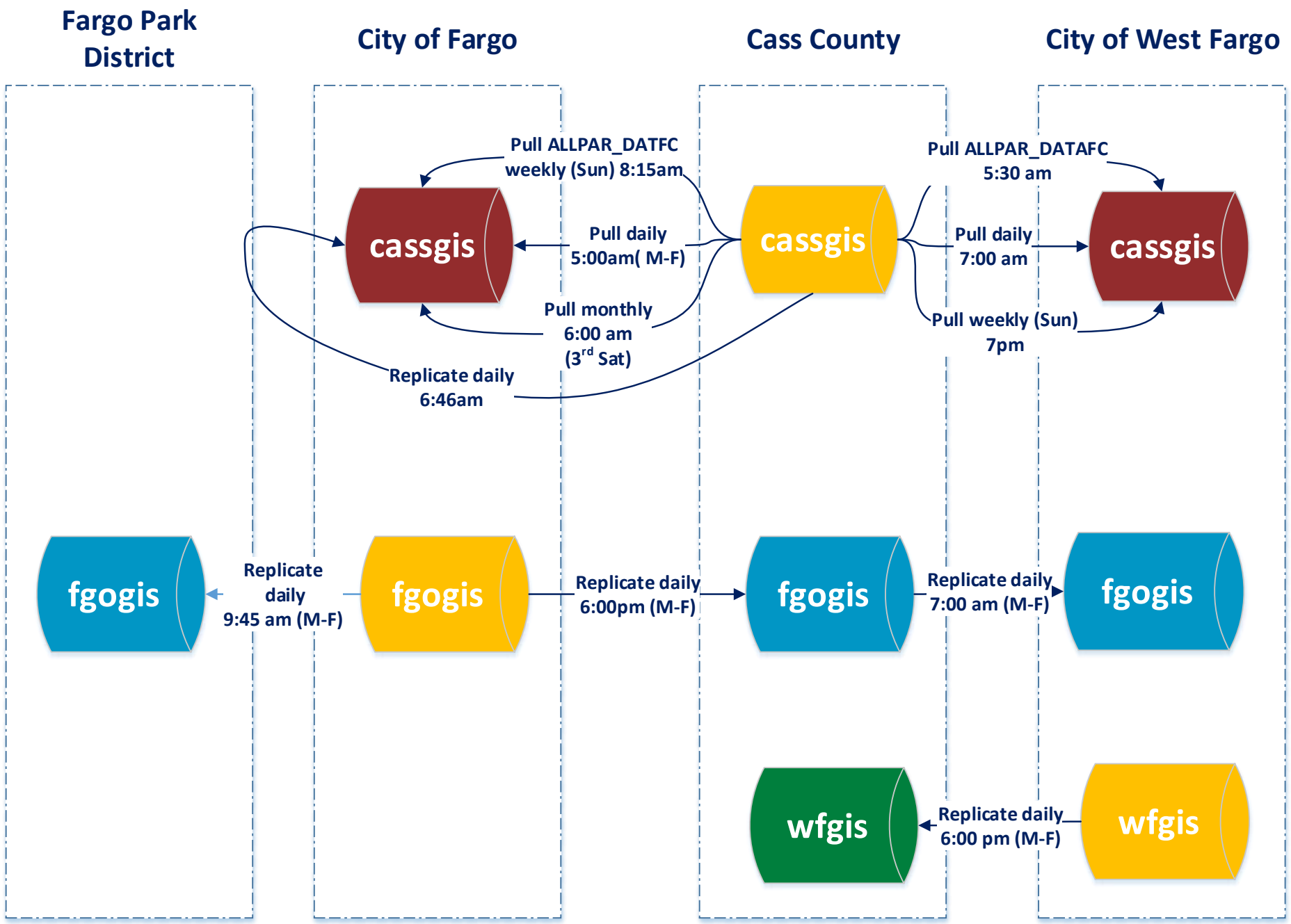
New last week, schedule TBD…..

  - Cass pull from Fargo.
  - West Fargo pull from Fargo (at Cass).

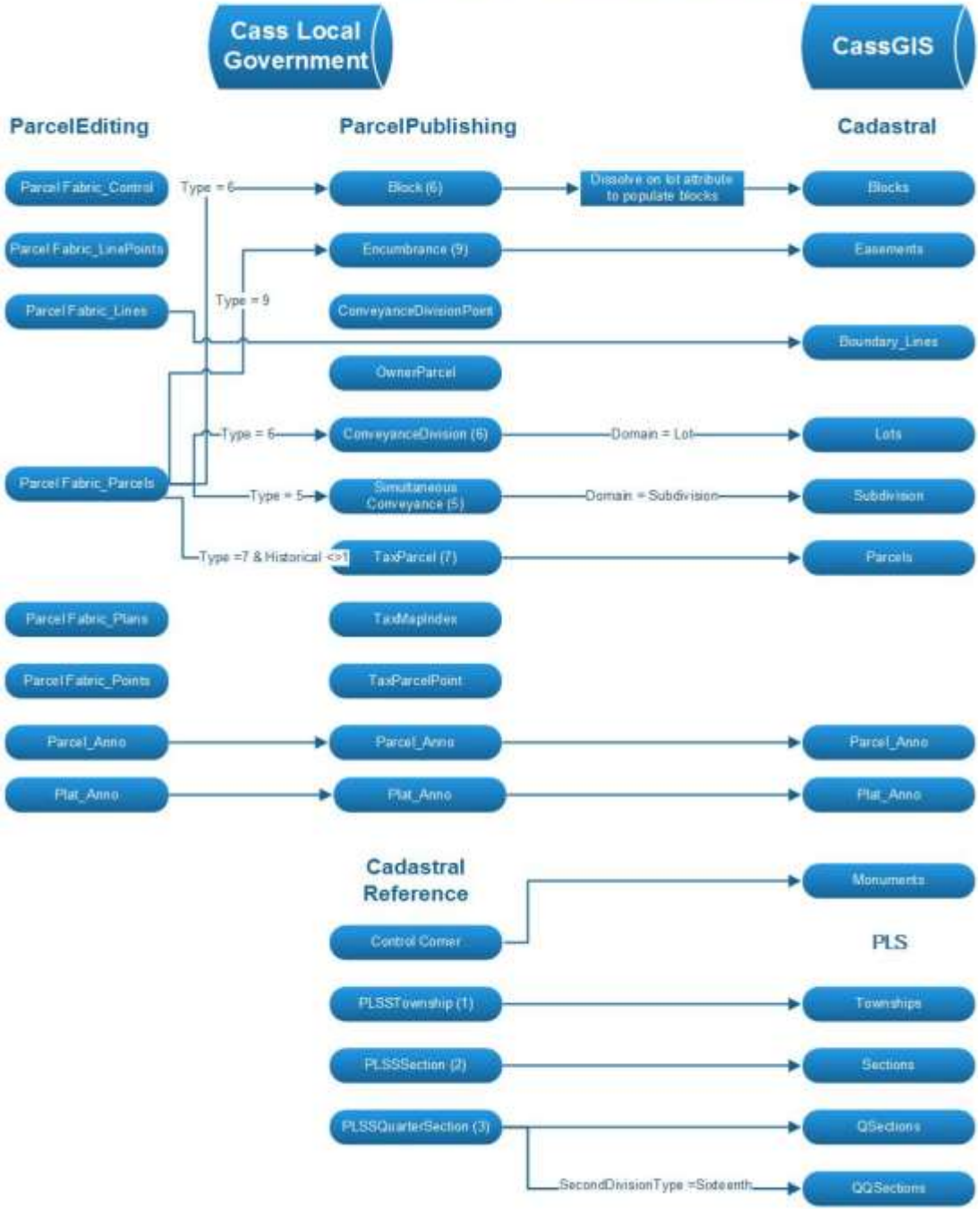
# Batch Scripts, Replication & Python

(Hybrid v3)



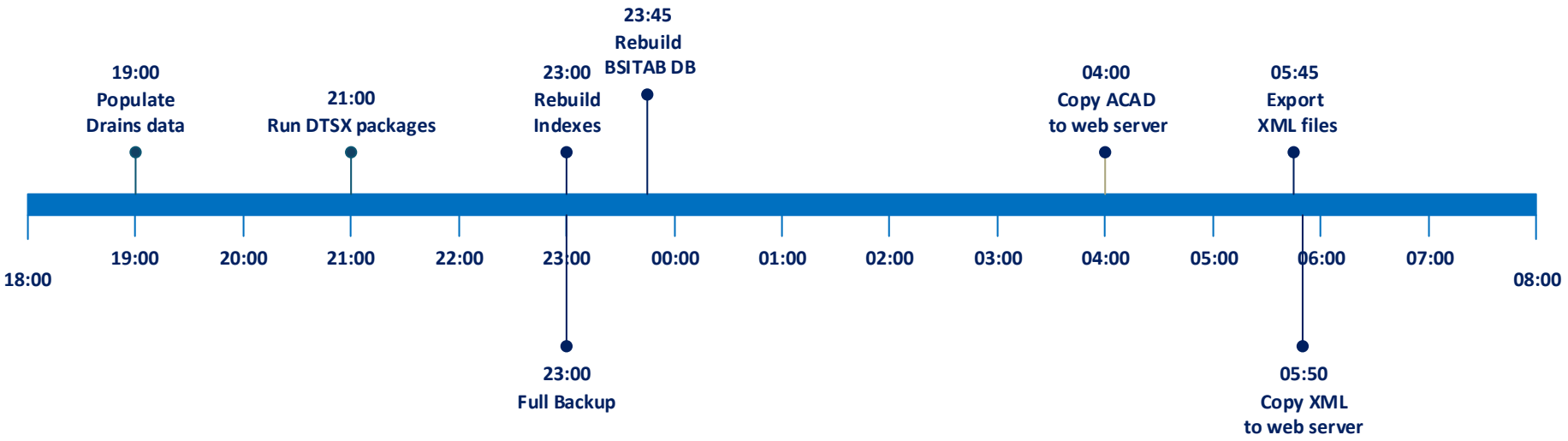

Fargo Park District
City of Fargo
Cass County
City of West Fargo
Pull ALLPAR_DATFC weekly (Sun) 8:15am
Pull ALLPAR_DATAFC 5:30 am
cassgis
cassgis
cassgis
Pull daily 5:00am( M-F)
Pull daily 7:00 am
Pull monthly 6:00 am (3rd Sat)
Pull weekly (Sun) 7pm
Replicate daily 6:46am
fgogis
fgogis
fgogis
fgogis
Replicate daily 9:45 am (M-F)
Replicate daily 6:00pm (M-F)
Replicate daily 7:00 am (M-F)
wfgis
wfgis
Replicate daily 6:00 pm (M-F)

# Editing to Publishing to Cass Geodatabase Script

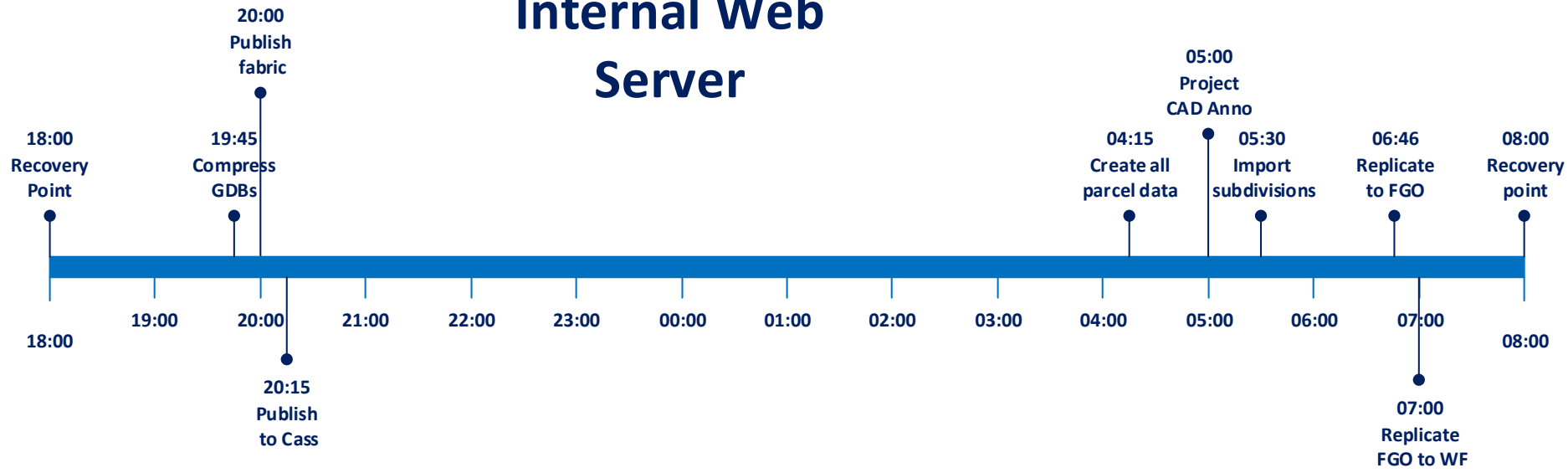


# Cass County Scheduled Tasks

## SQL Server




## Internal Web Server



# Challenges

- Multiple scheduled tasks and backups at each entity running through the evening.
- Difficult to find an “ideal” time slot.
- Security concerns.
- Different platforms for ancillary data (tax, assessor etc.)
- Software versions always need to be in sync; schedule upgrades at same time.
- Schema changes need to be repeated in all copies of the database.

# Challenges continued…

- West Fargo maintains cadastral data, while Cass continues to maintain address point and centerline coverage on their behalf.
- Fargo edits their own centerlines at Cass County using SQL logins.
- Need to support new projects with new attributes e.g. NG-911 effort in ND.

# Other collaboration efforts

- MCOG imagery & LIDAR acquisition.
- Contribution to Community maps (Cass, Fargo, Moorhead).
- Data for RRRDC.
- ND DES seamless basemap.
- ND GIS Hub.
- Cass County Multi Hazard Mitigation Plan.

# Lessons Learnt (The king's English)

- Replication is not a viable option when LGIM is partially used.
- Need dedicated high speed connection.
- Data stewards at each entity must understand workflow and be aware if tasks are failing.
- **NO** changes should be made to schema without first contacting other entities.
- **NO** software upgrades should take place unless agreed upon by all 4 parties.

# Conclusions

- Data sharing has benefitted all entities.
- Countywide data requests can be easily fulfilled by Cass County.
- Staff & citizens see the most current and relevant data for their entity.
- Cooperation & communication are critical for this process to succeed.

# Questions?